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# Foreign Animal Disease Report

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United States  
Department of Agriculture

Animal and Plant  
Health Inspection Service

Veterinary Services

I  
Emergency  
Programs



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## Emergency Programs Activities

**Field Investigations.** During the first quarter of fiscal year 1993 (October 1, 1992–December 31, 1992), veterinarians from the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), and the State departments of agriculture conducted 51 investigations of suspicious foreign animal diseases (FAD) in the United States to eliminate the possibility that an exotic disease may have been introduced. These investigations included 16 for vesicular conditions, 7 for exotic Newcastle disease in pet birds and poultry, 5 for avian influenza, 1 for encephalitic conditions, 2 for mucosal diseases, 1 for septicemia, and 19 for undesignated conditions.

There were 18 investigations conducted in VS' Northern Region, 16 in the Southeastern Region, 11 in the Western Region, and 6 in the Central Region. No FAD or pests were found.

(Dr. M. A. Mixson, Emergency Programs, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-8073)

## Secretary's Advisory Committee on Foreign Animal and Poultry Diseases (FAPD)

The Advisory Committee on FAPD advises the Secretary on the means to prevent, suppress, control, or eradicate an outbreak of foot-and-mouth disease (FMD) or other destructive foreign animal or poultry diseases should they enter the United States. Committee duties involve advising and counseling on policy and regulatory actions pertaining to a disease outbreak and changing practices in the production and marketing of animals, the importation of animals and animal products, and the handling and

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treatment of unusual animal or poultry disease problems. The committee represents all interests concerned with contagious diseases within the livestock and poultry industries, including producers, processors, veterinarians, and other scientists.

Currently, 19 members serve on the committee: Mr. Philip E. Bradshaw, Griggsville, IL; Dr. Edward T. Braye, Tuskegee Institute, AL; Dr. H. Steve Conboy, Lexington, KY; Dr. B. C. Easterday, Madison, WI; Mr. William C. Gallagher, Stephens, SD; Ms. Arlene Ham, Rapid City, SD; Dr. Cathy A. Johnson-Delaney, Edmonds, WA; Dr. Karen R. Jordan, Siler City, NC; Mr. Alfred W. Keating, Arlington Heights, IL; Mr. John H. Lang, Stoughton, WI; Dr. Raymond Loretto, San Ysidro, NM; Dr. Richard H. McCapes, Davis, CA; Dr. Victor F. Nettles, Jr., Watkinsville, GA; Mr. James B. Owens, Tyler, TX; Dr. Archibald B. Park, Arnold, MD; Dr. Willie M. Reed, Okemos, MI; Dr. Arthur V. Tennyson, Northbrook, IL; Dr. Thomas R. Thedford, Stillwater, OK; Ms. Michelle C. Turner, Water Valley, TX; and Dr. Taylor H. Woods, Cabot, AR. Their appointment terminates on July 20, 1994.

## Foreign Animal Disease Update

This update consolidates information from Office International des Epizooties (OIE) bulletins into tables covering July through September 1992. Countries reporting disease outbreaks are listed below the appropriate disease heading (followed by the month/year of the report and total number of outbreaks reported for that time period). The notation "+" indicates that the presence of disease was reported without information on total number of outbreaks. Outbreak number followed by "+" indicates number of outbreaks as well as the presence of disease.

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### Foot-and-Mouth Disease

#### *Virus untyped*

Bhutan (5-7/92) 10  
Brazil (5&6/92) 244  
Chad (3-5/92) 20+  
Hong Kong (5/92) 1  
India (1-4/92) 1,068  
Iran (1-3/92) 60  
Laos (4-6/92) +  
Myanmar (6-8/92) 6  
Nigeria (4&6/92) 2  
Pakistan (6&7/92) +  
Paraguay (6,8&9/92) 10  
Thailand (7&8/92) 5

#### *Virus O*

Algeria (6/92) 7  
Bolivia (1&2/92) 2  
Brazil (5&6/92) 22  
Burkina Faso (7/92) 2+  
Colombia (5-7/92) 33  
Ethiopia (7/92) 3  
Iran (1-3/92) +  
Malaysia (7&8/92) 14  
Morocco (7-9/92) 8  
Oman (5&6/92) 51  
Pakistan (6/92) +  
Paraguay (6&8/92) 7  
Sri Lanka (1-6/92) 66  
Thailand (7&8/92) 7  
Tunisia (5-7/92) 8  
Turkey (6-8/92) 66  
Venezuela (2&3/92) 1

#### *Virus A*

Brazil (5&6/92) 11  
Colombia (5-7/92) 40  
Iran (3/92) +  
Pakistan (6&7/92) +  
Turkey (7&8/92) 3  
Venezuela (1-8/92) 40

#### *Virus SAT 1*

Zambia (7/92) 1

#### *Virus SAT 2*

Kenya (1-3/92) +  
South Africa (8/92) 2

#### *Virus Asia I*

Myanmar (8/92) 12  
Thailand (7&8/92) 0

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### Vesicular Stomatitis

#### *Virus untyped*

Panama (6-8/92) 10

#### *Virus Indiana*

Colombia (6&7/92) 12  
Costa Rica (4/92) 1  
El Salvador (6/92) 1  
Panama (6&7/92) 3  
Venezuela (3-5/92) 2

#### *Virus New Jersey*

Colombia (5-7/92) 48  
Costa Rica (6/92) 1  
El Salvador (4-6/92) 19  
Honduras (4&6/92) 1  
Mexico (6/92) 8  
Panama (6&7/92) 3  
Venezuela (1&6-8/92) 2

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**Swine Vesicular Disease**

India (1-4/92) 36  
Italy (6,8&9/92) 21  
Netherlands (7/92) 3  
Oman (5&6/92) 6  
Russia (1/92) 1

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**Rinderpest**

Ethiopia (7/92) 1

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**Bluetongue**

India (1-3/92) 19  
South Africa (6-8/92) +  
United States (4-7/92) +

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**Fowl Plague**

Australia (7/92) 1  
Senegal (4&5/92) +  
Thailand (8/92) 2

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**Newcastle Disease**

*Virus not characterized*  
Albania (8/92) 5  
Algeria (6/92) 1  
Brazil (5/92) 3  
Chad (3-5/92) +  
Colombia (5/92) 1  
Congo (5-7/92) +  
Egypt (5/92) 2  
Germany (7&9/92) 2  
Guinea (7-9/92) +  
Hong Kong (5&7/92) 2  
India (1-4/92) 181  
Iran (1-3/92) 78  
Ireland (7/92) 1  
Laos (4-6/92) +  
Madagascar (1&2/92) 6  
Malaysia (1-3,5-8/92) +  
Mexico (6-8/92) 5  
Mozambique (6-9/92) +  
Myanmar (6-8/92) 12

Netherlands (8/92) 1  
Nigeria (6/92) 1  
Pakistan (6/92) +  
Philippines (7&8/92) +  
Senegal (4&5/92) +  
Sierra Leone (6&7/92) +  
Thailand (7&8/92) 5  
Turkey (6-8/92) 12  
Yugoslavia (8/92) 1  
Zaire (5-8/92) +  
Zambia (5&6/92) +

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**Velogenic virus**

Indonesia (1-6/92) +  
Korea (6-8/92) 12  
Malaysia (2&5-7/92) 5  
Mauritius (1-8/92) +  
Sri Lanka (1-7/92) 106  
United States (7/92) 1

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**Rift Valley fever**

Mozambique (6-9/92) +  
Zambia (5&6/92) +

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**Sheep and goat pox**

Algeria (6/92) 7  
India (1-4/92) 93  
Iran (1-3/92) 101  
Israel (8/92) 2  
Israel/Controlled  
Territories (8/92) 3  
Mali (6/92) 2  
Morocco (6,7&9/92) 5  
Oman (5&6/92) 15  
Senegal (4,6&7/92) 7  
Tunisia (2,4-7/92) 30  
Turkey (6-8/92) 43

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**Peste des petits ruminants**

Guinea (7-9/92) +  
Nigeria (4-7/92) 5  
Oman (5&6/92) 25  
Senegal (4,5&7/92) 9

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**African swine fever**

Congo (6&7/92) +  
Italy (6-9/92) 50  
Mozambique (6-9/92) +  
Senegal (4&5/92) +  
South Africa (7/92) 1  
Spain (6-9/92) 35  
Zaire (5-8/92) +

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**African horse sickness**

Botswana (5/92) 1  
Mozambique (6-9/92) +  
Senegal (6&7/92) 3  
South Africa (6-8/92) +  
Zimbabwe (7/92) 1

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**Hog cholera**

Austria (6-8/92) 6  
Brazil (5&6/92) 23  
Bulgaria (7-9/92) 4  
Chile (6&7/92) 17  
Colombia (5-7/92) 9  
Congo (5/92) +  
Croatia (2/92) +  
Germany (7&8/92) 3  
Hong Kong (5&7/92) 3  
India (1-3/92) 98  
Italy (6,7&9/92) 11  
Korea (6&7/92) 10  
Laos (4-6/92) +  
Mauritius (1-8/92) +  
Mexico (6&7/92) 5  
Myanmar (6-8/92) 3  
Philippines (6-8/92) +  
Russia (1-4,6-8/92) 30  
Taiwan (7-9/92) 7  
Thailand (7&8/92) 3  
Yugoslavia (7/92) 1

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**Contagious bovine  
pleuropneumonia**

Guinea (7-9/92) +  
Italy (6,8&9/92) 7  
Mali (5,6,8&9/92) 6  
Nigeria (4/92) 4  
Portugal (5&6/92) 33

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**Lumpy skin disease**

Botswana (5-8/92) +  
Madagascar (1&2/92) 34  
Reunion (7&8/92) 2+  
South Africa (6-8/92) +  
Swaziland (3/92) +  
Zaire (7&8/92) +  
Zambia (5&6/92) +  
Zimbabwe (7-9/92) 25

The tropical bont tick, *Amblyomma variegatum*, which parasitizes both domestic animals and wildlife, was introduced into the Caribbean about 1830 when infested cattle were imported into Guadeloupe from Senegal, West Africa. *A. variegatum* is an important vector of the rickettsia *Cowdria ruminantium*, the causative agent of heartwater (cowdriosis) in ruminant animals. When heartwater is introduced into disease-free areas or when susceptible livestock are introduced into areas where heartwater is endemic, the disease causes high mortality. Heartwater is endemic on Guadeloupe, Marie Galante, and Antigua.

The incidence of acute dermatophilosis, a skin infection caused by the bacteria *Dermatophilus congolensis*, increases dramatically when *A. variegatum* invades a previously uninfested area. Mortality from 80 to 100 percent can be expected from acute infection of *D. congolensis* in susceptible livestock exposed to this disease. An example of the mortality in livestock is presented in table 1. In both St. Christopher and Nevis, about 80 percent of all livestock were either slaughtered because of dermatophilosis or died from the disease.

**Table 1—Livestock population changes in St. Christopher and Nevis**

Year	St. Christopher			Nevis		
	Cattle	Sheep	Goats	Cattle	Sheep	Goats
1984	5,831	9,254	7,223	1,908	11,135	6,445
1987*	2,627	1,606	1,896	720	5,165	3,521
1992	1,200	2,500	3,000	680	9,000	7,550

\* After the slaughter of a large proportion of the animal livestock on St. Christopher and Nevis, the importation of meat increased to replace the locally produced animals lost to the supply chain. At the same time, local consumption of beef declined while that of chicken, a cheaper source of meat, increased.

Whenever *A. variegatum* and its associated diseases are found, producers experience losses in livestock production. Mortality of livestock is especially acute in susceptible livestock imported into the islands. These animals are needed in order to increase production of animal protein and products for human consumption. Additional economic losses occur because producers must treat their animals with acaricides to control ticks and with antibiotics to try to reduce mortality due to diseases such as dermatophilosis.

In uninfected countries of the Caribbean as well as mainland countries of North, Central, and South America, including portions of Mexico and the Southern United States surrounding the Caribbean region, livestock production is threatened by the presence of *A. variegatum* and its associated diseases (fig. 1). Once the disease reaches the mainland countries, serious economic losses in livestock and livestock production will occur. Three other *Amblyomma* species, *A. dissimile*, *A. maculatum*, and *A. cajennense*, have been shown experimentally to transmit heartwater to goats. *A. dissimile* is distributed widely throughout the Caribbean and North, Central, and South America. *A. maculatum* is distributed widely in the United States, Mexico, and Central America (fig. 2). *A. cajennense* (fig. 3) is also widely distributed in the United States and Central and South America and is found in Jamaica, Cuba, and Trinidad as well.

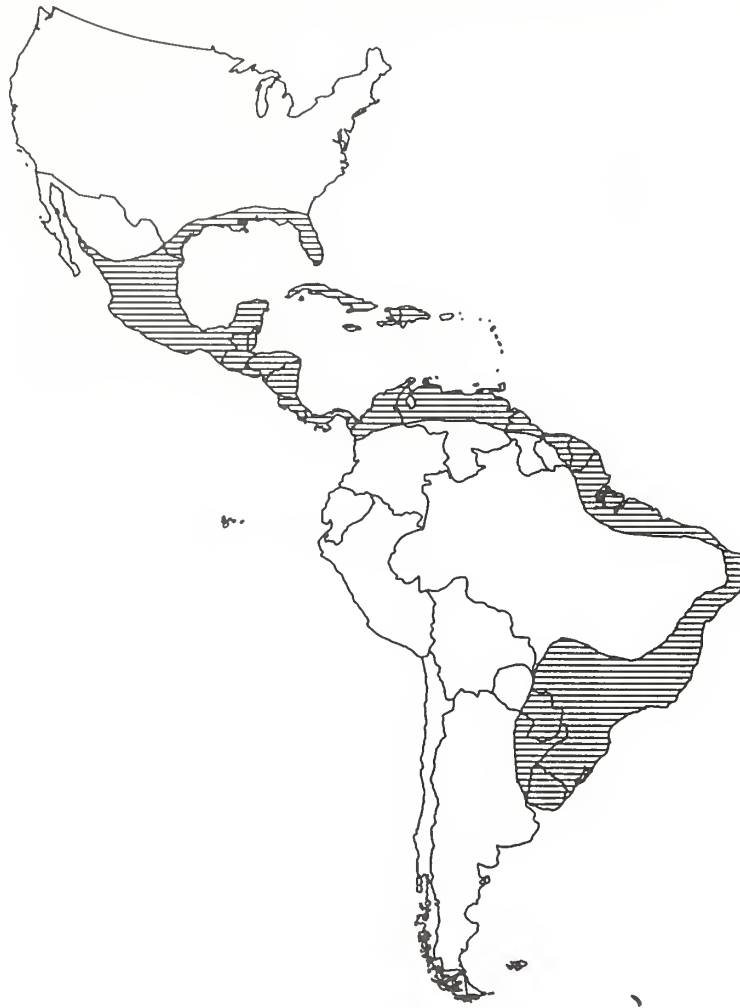


Figure 1 — Potential distribution of *Amblyomma variegatum* in the Western Hemisphere (Modified from Sutherst and Maywald, 1985).

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*A. variegatum* is widely distributed within the Caribbean region. For a number of years, it was found only on Guadeloupe and the adjacent islands of Marie Galante and Antigua. However, over the last 50 years, the tick has migrated and is now found on 14 different islands (table 2). Although the tick is not considered to be established on St. Vincent, it is significant that one male tick was found. In a similar situation, only one male was found in Barbados in 1983 but later, in 1990, reproducing populations were discovered.

**Table 2—Distribution of *A. variegatum* in the Caribbean**

Country and date first found					
Guadeloupe	1830	Puerto Rico	1974*	La Desirade	1982
Marie Galante	1830	Nevis	1977	Dominica	1983
Antigua	1868?	St. Christopher	1978	Montserrat	1983
Martinique	1948	St. Martin	1978	Culebra	1986*
St. Croix	1967*	Anguilla	1978	St. Vincent	1988**
St. Lucia	1970	Vieques	1981*	Barbados	1990

\* The tick was eradicated from St. Croix in 1970 and a second time in 1989. The tick was eradicated from Puerto Rico in 1989 and again in 1992. The tick has been eradicated from Vieques and Culebra.

\*\* Only one male tick was found on St. Vincent.



**Figure 2 — Distribution of *Amblyomma maculatum* in the Western Hemisphere.**



Figure 3 — Distribution of *Amblyomma cajennense* in the Western Hemisphere.

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In the last 10 years, the tick has been found infesting livestock on 18 islands in the Caribbean, and it continues to spread to previously uninfested locations. Recent evidence indicates that migratory birds, especially the cattle egret, may play an important role in the spread of the tropical bont tick in the Caribbean. Cattle egrets appeared in the Caribbean in the late 1950's and became well established as breeding colonies on a number of islands during the 1960's and 1970's. The tick began to spread to a number of islands during the 1970's, and immature stages of the tick have been found on cattle egrets. Such circumstantial evidence suggests that cattle egrets may play an important role in the spread of the tick in the Caribbean.

Recent research carried out by the Southeastern Cooperative Wildlife Disease Study, University of Georgia, and the Institut d'Elevage et de Médecine Veterinaire des Pays Tropicaux, Guadeloupe, French West Indies, indicates that not only do cattle egrets migrate frequently, they may do so over long distances. One bird captured alive and marked in Guadeloupe was sighted in Layton, Long Key Island, FL, some 1,152 miles (1,920 km) north, while another bird marked in Guadeloupe was sighted about 240 miles (400 km) to the south in Grenada.

To stop the spread of *A. variegatum* and its associated diseases, the Food and Agriculture Organization of the United Nations (FAO) and others, including APHIS, have proposed that a regional eradication program be initiated. The technology needed to eradicate the tick from a given island is available. Furthermore, eradication programs have been carried out successfully on St. Croix, Puerto Rico, Vieques, and Culebra. This technology involves the efficient delivery of an effective acaricide to all domestic hosts every 14 days for a period of 2 years. The primary goal of the eradication technique is to prevent adult ticks from mating on the host and thus prevent the production of offspring.

Efforts by FAO and other organizations, governments, and interested parties over the last 6 years have resulted in:

1. The establishment of an infrastructure and cooperative relationships among all the principals involved in the proposed regional eradication program.
2. The completion of a program proposal for a Caribbeanwide eradication program, including a cooperative element relating to the implementation of the eradication efforts on the French islands.
3. Assistance with review and drafting of legislation required to support a tick eradication campaign on each of the Economic Community of the Caribbean Countries (CARICOM) islands presently infested with *A. variegatum*.
4. Identification of a number of potential donors who have expressed support for the proposed regional eradication program but who have not officially committed to the financial aspects of the program.

Further delays in implementing the regional eradication program could lead to further spread of the tick. The potential for introduction of the tick and its associated diseases into the United States increases with every new infestation.

(Dr. G. I. Garris, FAO, Bridgetown, Barbados, 809-426-7110)

*Editor's Note:* *A. variegatum* was reidentified on St. Croix in May 1993.

Under the terms of a ministerial order dated January 14, 1993,\* Mexico has been declared free from viral hemorrhagic disease of rabbits. All restrictive measures relating to rabbit transport, transit, and marketing introduced as a result of this disease have been lifted. In the future, VHD of rabbits is to be considered as exotic to Mexico.

The presence of VHD of rabbits was reported on February 21, 1989, and a national animal-health emergency scheme was immediately set up with the aim of eradicating the disease. During the eradication campaign, 121,275 rabbits were slaughtered in 14 States and in the Federal District. The last case was reported in April 1991.

According to available information, Mexico is the first country in the world to have eradicated this disease from its territory.

\*Order issued by the Secretariat for Agriculture and Hydraulic Resources, published in the Official Journal of the Federation of Mexico on January 20, 1993.

(Dr. H. Campos Lopez, Director General of Animal Health Department, Secretariat for Agriculture and Hydraulic Resources, Mexico City, phone number 534-9473/5111)

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**Eradication of Viral Hemorrhagic Disease (VHD) of Rabbits in Mexico**

The screwworm outbreak in Mexico remains under control with no new cases reported since September 30, 1992. Because of the success of the control effort, sterile fly release in Mexico was reduced to 17 million flies per week, effective February 1, 1993. As no further cases were reported, sterile fly release in Mexico due to the outbreak ended February 28, 1993. Mexico opened its southern border to cattle imports at the end of December 1992.

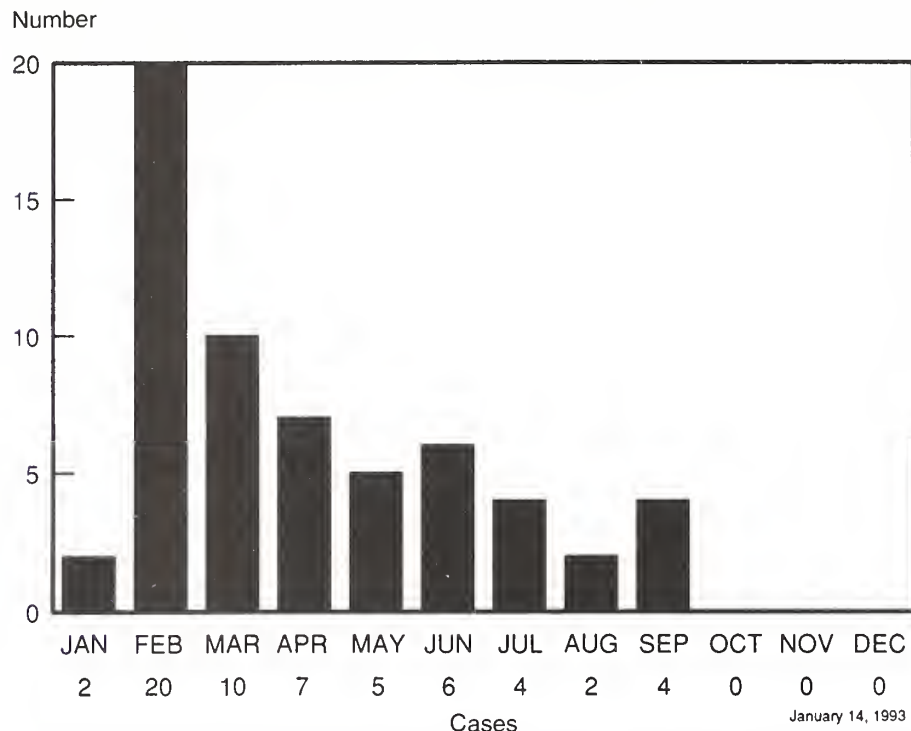


Figure 4 — Screwworm outbreak 1992: Chronology of cases.

The genetic strain of steriles in production at Tuxtla Gutierrez was changed from the old Orange Walk 1987 strain to the new Costa Rica 1991 strain. The name of the strain indicates where it was collected. Periodically, new strains are required due to changes in the old strain that occur as it adapts to artificial rearing conditions. Rates of sterility with the 1991 strain were shown to be significantly greater than with the 1987 strain.

The southward advance of the eradication front in Central America has been delayed approximately 1 year due to resource diversion for the outbreak in Mexico. There are no self-sustaining populations of screwworm in Belize or Guatemala, although tissue samples positive for screwworms are occasionally collected in these countries from imported cattle. Active eradication efforts are ongoing in El Salvador and Honduras. Coumaphos is being used to treat infected wounds in Nicaragua, although no sterile insects are yet available for release in Nicaragua.

Future plans include signing agreements to mount eradication campaigns with Costa Rica and Panama later this year.

(Edward Gersabeck, International Services, APHIS, USDA, Hyattsville, MD 20782, 301-436-8892)

## Screwworm Outbreak in Mexico 1992—A Final Summary

On January 24, 1992, a positive case of *Cochliomyia hominivorax* (Coquerel) myiasis was diagnosed at the diagnostic laboratory run by the Mexico–United States Commission for the Prevention of Foot-and-Mouth Disease and other Exotic Animal Diseases (EADC). The specimen, a larva in the third developmental stage, was obtained from a bovine on January 22, 1992.

Eradication actions were initiated, and the National Emergency System for Animal Health coordinated resources from EADC.

**Table 1—Chronology of the outbreak**

State	Positive diagnoses	Date of first diagnosis	Date of last diagnosis
Campeche	13	01-22-92	03-26-92
Chiapas	15	02-05-92	07-31-92
Tabasco	13	02-17-92	09-09-92
Veracruz	10	03-21-92	09-13-92
Tamaulipas	10	04-24-92	09-30-92

The peak of the outbreak occurred in February 1992, when 19 positive cases were diagnosed. In the following 7 months, incidence declined until the end of September, when the last case was reported at Villa Aldama, Tamaulipas.

[This summary was abstracted from an analysis of foreign animal diseases issued by the EADC.]

(Dr. C. M. Groocock, Emergency Programs, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-8240)

*Editor's Note:* Screwworm larvae were reidentified in Mexico in May 1993.

## Scrapie Program in the United States

The voluntary scrapie flock-certification program went into effect on October 1, 1992. The program calls for the gradual development of sheep flocks that are certified to be free of scrapie, with participating flocks progressing through four classes over time. There is a minimum time limit that a flock must spend within a given class, and each class has specific requirements for flock recordkeeping, purchase of new animals, animal identification, actions upon animal deaths, and submission of diagnostic samples. The regulations governing the certification program also impose restrictions on the interstate movement of animals from infected and source flocks.

The National Scrapie Oversight Committee held its first meeting on November 2, 1992. All of the interest groups involved in the scrapie negotiated rulemaking process are represented on this committee, the purpose of which is to advise the Deputy Administrator of APHIS, VS, on policy and technical aspects of the program. State scrapie certification boards have also been established to administer the program at the State level and to review applications for enrollment. These boards are comprised of the APHIS Area Veterinarian-in-Charge, animal producers and allied industry representatives, an accredited veterinarian, and a State animal health official.

APHIS has also published the final rule for a new indemnification program that provides for the depopulation of scrapie-infected and source flocks. Approximately \$1.9 million in contingency funds has been set aside for this effort. The program went into effect on January 8, 1993, and was set up to continue for 180 days. The indemnification payment is fixed at \$150 for a registered animal and \$50 for each unregistered animal. Before any indemnification payment is made, the flock owner must agree that if he or she maintains any flock after receipt of indemnification, the owner will do so in accordance with the voluntary scrapie flock certification program.

(Dr. D. E. Harpster, Sheep, Goat, Equine, Poultry, and Miscellaneous Diseases, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-6954)

245  
**Bovine Spongiform  
Encephalopathy  
(BSE) Worldwide**

Since December 4, 1992, Great Britain (excluding Northern Ireland) has had 9,603 newly confirmed cases of BSE, with 1,810 additional herds affected. About 42 percent (up from 39.7 percent on December 4) of the dairy herds and 8 percent (up from 7 percent) of the beef suckler herds in Great Britain have been affected (table 1).

More than 100 additional confirmed cases of BSE have been reported from Northern Ireland during the period December 1992 through February 1993, while the Republic of Ireland and Switzerland have had 9 and 2 cases, respectively.

**Table 1—Bovine spongiform encephalopathy:  
descriptive epidemiologic statistics for Great Britain\*  
as of February 26, 1993**

Total number of confirmed cases	86,556
Total number of affected herds	23,915
Proportion of dairy herds affected	41.9%
Proportion of beef suckler herds affected	8.1%

\*England, Scotland, and Wales

**Table 2—Other countries affected by BSE**

Country	Imported cases	Native cattle	No. of cases	Date of last report
Northern Ireland	Yes	Yes	755	15 Mar 93
Republic of Ireland	Yes	Yes	68	10 Mar 93
Switzerland	No	Yes	2	5 Mar 93
France	No	Yes	5	31 Jul 92
Oman	Yes	No	2	31 Jul 92
Falkland Islands	Yes	No	1	4 Sep 92
Denmark	Yes	No	1	10 Aug 92

Sources: Dr. O. Denny, Northern Ireland; Dr. A. Doherty, Republic of Ireland; Dr. B. Hornlimann, Switzerland; and Dr. J. Wilesmith, Great Britain.

(Dr. C. M. Groocock, Emergency Programs, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-8240)

## **New Disease Found in U.K. Cattle**

A fatal central nervous system (CNS) disorder has been discovered in beef cattle by veterinarians working to eradicate BSE or "mad cow disease."

The new illness, which has caused a form of epilepsy in some of the animals, was found after cattle were mistakenly slaughtered as BSE suspects. The disease was discovered by Scottish Government scientists at the Lasswade veterinary laboratory in Penicuik, near Edinburgh, when they found that submissions of brain tissue from slaughtered cattle lacked the characteristic spongiform lesions which are the hallmark of BSE. Further examination of the tissue located lesions in the brainstem of these animals.

BSE is believed to be caused by feeding cattle rations containing the remains of sheep infected with scrapie—a similar CNS disorder of sheep and goats. However, it is unlikely that these particular cattle consumed this type of ration. The etiology of the new disease is unknown, and like BSE, there is no known cure. So far, 25 cases have been confirmed in Britain. Two of the cattle showed "maniacal" symptoms.

Some veterinarians believe that the disease may be caused by a mineral deficiency, perhaps zinc. U.K. government officials state that there are no implications for public health.

[This summary was abstracted from an article by David Brown published in the (London) Daily Telegraph. The complete abstract is available in the Joint Publications Research Service report Epidemiology, dated January 15, 1993.]

(Dr. C. M. Grocock, Emergency Programs, VS, APHIS, USDA, Hyattsville, MD 20782, 301-436-8240)

## **Foot-and-Mouth Disease (FMD) Outbreak in Hong Kong**

Local newspapers in Hong Kong reported that a massive outbreak of FMD has killed thousands of pigs in the territory. According to a report in the Hong Kong Ming Pao on November 22, 1992, 100,000 pigs, or 40 percent of the total pig population, were infected. The Hong Kong Standard reported on the outbreak the same day but stated that 70 percent of the island's pigs were affected. Farmers said that the vaccine, which could have stopped the outbreak, was in short supply.

According to the Ming Pao report, the chairman of the Hong Kong Federation of Pig Raising Cooperative Societies said that the shortage had driven up the cost of vaccine by over 63 percent, from HK \$66 to HK \$98 per 20 doses, and the federation is urging the Hong Kong Government to step in to ease the vaccine supply and price problems. Ming Pao interviews with vaccine suppliers revealed that the major suppliers were in France, the Netherlands, and Britain.

Farmers told reporters that losses are running at H.K. \$3 million (U.S. \$385,000) and growing. A spokesman for the federation estimated that about 10,000 infected pigs had already died from May through October 1992. However, according to Agriculture and Fisheries Department (AFD) records, only 6 reports involving a total of 2,500 infected animals were received in the same period.

AFD officials pointed out that it is not possible to estimate the number of affected pigs accurately at any given point because some affected pigs may not show clinical symptoms. In addition, AFD does not have the resources to carry out a full survey on farms. AFD has always relied on farmers' reports of disease outbreaks, and Hong Kong stipulates that farmers must report identifiable animal diseases to AFD.

The Federal spokesman said that FMD is recurrent. In the Hong Kong outbreak, only 10 percent of vaccinated pigs died when infected, but the mortality rate jumped to 50 percent when the vaccine was in short supply. An AFD spokeswoman said that sudden weather changes and crowded rearing grounds led to infection, but proper husbandry of affected pigs helped to cure them in a few days. She also said that the Government of Hong Kong had no policy of offering compensation to farmers, but she stressed that farmers could apply for loans if they need financial assistance. AFD said it was looking closely at the problem while working with the World Reference Center at Pirbright in Great Britain concerning the current outbreak.

[This summary was abstracted from unofficial newspaper sources.]

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**Avian Influenza (AI)  
Surveillance in the  
United States**

On January 2, 1993, the National Veterinary Services Laboratories (NVSL) found a flock of 32,000 turkeys from Montgomery County, PA, to be serologically positive for an H5N2 strain of AI. The mortality rate in the flock fell within the normal range, but the owner noticed a problem because large, healthy turkeys were dying. All attempts at virus isolation from this flock and its environment were negative.

Because the H5N2 subtype of AI virus has been identified as a cause of highly pathogenic avian influenza (HPAI), precautionary depopulation measures were taken by the State of Pennsylvania. Surveillance of premises within a 3-mile (4.8-km) radius of the affected flock resulted in no virus isolation. However, on January 9, 1993, three chickens at a poultry show in Harrisburg, PA, tested positive for AI subtype H5N2 on the agar gel immunodiffusion test.

Epidemiologic information indicated a possible connection between the affected turkey flock and a particular Philadelphia live-poultry market. Though no direct connection could be shown, an AI subtype H5N2 virus was isolated from chickens at that Philadelphia market. This finding prompted the Pennsylvania Department of Agriculture to issue restrictions on the transport of live birds to auctions and markets and to suspend statewide poultry exhibitions.

The H5N2-positive Philadelphia market was, in turn, linked to other live-poultry markets in the Northeast. It soon became evident that immediate action had to be taken to assess the distribution of the AI virus within Northeastern States and its potential threat to the domestic poultry industry. In January 1993, APHIS, VS, and the affected State departments of agriculture instituted a joint cooperative AI surveillance effort.

This effort involved sampling live-poultry and auction markets for virus isolation and serology. New York, New Jersey, Pennsylvania, Ohio, and certain New England States participated in this testing program. All birds positive for H5N2 AI virus were traced back to their flocks of origin, and samples were collected from these flocks. If H5N2 AI virus was isolated from a source flock, circle testing to monitor the 3-mile perimeter around this flock was instituted. Poultry haulers' trucks and premises were also randomly tested in some States.

After the first phase of testing, AI virus subtype H5N2 was isolated from five live-poultry markets in New Jersey and eight live-poultry markets in New York. The markets in Connecticut, Rhode Island, and Massachusetts demonstrated no evidence

of the virus. All positive live-bird markets were depopulated through controlled slaughter, cleaned and disinfected, and then retested at 15- to 30-day intervals. Tracebacks from the first phase of surveillance market testing uncovered a single backyard flock operation in New Jersey from which H5N2 AI virus was isolated. This 800-bird flock, which included a wide assortment of free-ranging poultry and pet birds, was quarantined and subsequently depopulated.

By the end of February 1993, all live-poultry markets from which H5N2 subtype AI virus had been isolated were tested. No virus was reisolated from markets in Connecticut, Massachusetts, Rhode Island, Pennsylvania, or New Jersey. However, the H5N2 subtype AI virus was reisolated in New York from two of the previously infected markets.

The third phase of market surveillance testing occurred in March 1993. All New Jersey markets tested negative for a second consecutive time. In New York, H5N2 virus was reisolated from one previously infected market for a third consecutive time. The H5N2 virus was also isolated from three previously untested New York markets. On March 24, 1993, H5N2 virus was isolated from a small poultry-hauling operation in Pennsylvania. This flock was depopulated, and source flocks in Pennsylvania and New Jersey were tested.

As of April 15, 1993, NVSL also detected antibody to H5N2 AI in backyard flocks from Pennsylvania (3), Delaware (2), Virginia (1), New Jersey (1), and Maryland (1). No virus was isolated from these premises. All of these seropositive flocks were placed under quarantine for further testing or depopulated.

Due to the close proximity of AI activity in the Delaware–Maryland–Virginia (Delmarva) area, poultry industry surveillance and biosecurity measures have been increased on the entire peninsula. The States of Delaware, Maryland, Virginia, Pennsylvania, New York, New Jersey, and Hawaii have imposed restrictions on the interstate and intrastate movement of poultry. Birds in transit are now required to have health certificates and permits issued by their respective departments of agriculture. In addition to these restrictions, some South American countries have imposed bans on the importation of poultry from the United States.

In summary, as of April 15, 1993, the H5N2 virus had been isolated from 1 market and 1 hauling operation in Pennsylvania, 11 markets in New York, and 5 markets and 1 backyard flock in New Jersey. In addition, an antibody against AI subtype H5N2 had been demonstrated in a total of nine backyard flocks. Surveillance efforts continue in the Northeastern United States and elsewhere. Surveillance through the use of sentinel birds in live-poultry markets and botanicals has been conducted in south Florida. Since January 1993, sentinel birds from three botanicals in the Miami area have tested positive on serology or virus isolation.

Infection with the H5N2 subtype AI virus has thus far been limited to live-poultry markets and backyard flocks. There has been no involvement of commercial poultry flocks. The virus identified has not been pathogenic to laboratory chickens or produced significant illness in flocks from which it was isolated.

Recent work performed at NVSL has demonstrated that the H5N2 virus isolates obtained from market surveillance testing are different from those that caused the 1983–84 AI outbreak in Pennsylvania. However, the 1992–93 virus isolates are similar in sequencing characteristics to the subtype that caused a severe outbreak in the United Kingdom in 1991–92.

Scientific studies suggest that this virus could mutate and become highly pathogenic if allowed to spread through a large population of birds. It has been shown that a single point mutation at the cleavage site is all that would be required for the present isolate to assume the molecular characteristics of the lethal form.

The virus is thought to circulate naturally in wild migratory waterfowl. Therefore, the commingling of free-flying waterfowl with backyard flocks provides a continual source of potentially infective virus. If the H5N2 virus continues to circulate through the early summer of 1993, it will expand exponentially as it passes through the waterfowl nestling population. This process will also increase the likelihood of mutation. Even if mutation does not occur, the expansion of the virus in the waterfowl population of the Northeastern States would pose a particular threat to free-range turkey producers and the economy of the turkey industry.

It is the opinion of the author that current surveillance practices should continue and be expanded to waterfowl. The threat to the poultry industry is still very real and depends to a great extent on the prevalence and distribution of virus in the wild. The risk of an AI epidemic occurring this fall could very well increase as a result of a possible mutation to high pathogenicity in waterfowl or increased viral load of the environment and challenge to domestic birds.

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**National Center for  
Import and Export  
(NCIE) Update—  
Quarterly Report**

Denmark was removed from the list of countries with BSE on January 14, 1993. Regarding swine vesicular disease (SVD), an interim rule became effective December 30, 1992, which amends Title 9 of the Code of Federal Regulations, Part 94.13, to add certain restrictions concerning the importation of pork and pork products from Denmark into the United States.

The regulation concerning the disease-free status of Spain has been amended following the February 22, 1993, report of an outbreak of SVD.

The comment period on the proposed rule declaring the Netherlands free of FMD and rinderpest closed on March 5, 1993.

Requests from Austria, Korea, Hungary, and Panama to be recognized free of specific animal diseases are pending.

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**Significant Diseases  
of Somalia, East  
Africa**

The objective of this article is to outline the significant animal diseases that present a risk of spread to the United States through the return of U.S. personnel or equipment engaged in Operation Restore Hope in Somalia, East Africa. The article outlines the etiologic agents, vectors, modes of transmission, susceptible species, control measures, and animal health implications of the most significant FAD prevalent in Somalia.

Current social and ecological conditions in Somalia may affect the transmission and incidence of many of the outlined diseases. In particular, the population of insect vectors may be reduced by the severe drought, which limits the reproductive capabilities of the insects. However, the onset of the rainy season in the first quarter of the year typically initiates an explosive increase in the insect population. Widespread

famine may lessen the transmission of disease by reducing the available animal hosts and/or reservoirs of disease.

Alternately, the incidence of other diseases may increase under those conditions due to the lack of health care; increased susceptibility to disease secondary to malnutrition and environmental stresses; crowding in the “feeding centers”; the high number of human deaths; and possibly inadequate disposal of bodies or animal carcasses.

It should be noted that available data concerning the incidence of diseases in Somalia are limited and may be outdated due to the disruption to the government and other social upheavals.

### **Diseases Carried by Flying Insects**

**African Trypanosomiasis**—The causative agents of the disease are three protozoa (*Trypanosoma congolense*, *T. vivax*, and *T. brucei brucei*). Transmission occurs via tsetse flies of the genus *Glossina* as biological vectors and mechanically via other biting flies. Cattle are predominantly affected, but sheep/goats, swine, equines, camels, dogs/cats, monkeys, and wild animals are also susceptible. Trypanosomiasis is endemic in Africa, but the decreased number of host animals and the ongoing drought in Somalia reduce the likelihood of vector magnification and disease transmission. The disease is unlikely to become established in the United States because that would require the importation of infected animals or the insect vector, and climatic conditions would preclude establishment of the tsetse fly vector in the United States. However, it is noteworthy that *T. vivax* is now endemic in South America, having been imported several decades ago on cattle from Africa, and has survived purely by mechanical transmission via biting flies indigenous to South America.

**African Horse Sickness**—The etiologic agent is a double-stranded ribonucleic acid (RNA) virus of the family Reoviridae, genus *Orbivirus*. Gnats of the *Culicoides* species are the principal biological vectors. Horses, mules, and donkeys are the primary natural hosts. African horse sickness is controlled by reducing the gnat vector through insecticides and by eliminating insect-breeding sites. Stabling of equids in insect-proof housing from dusk to dawn is also effective. Equids from endemic areas should be quarantined prior to entering the United States.

**Rift Valley Fever**—The etiologic agent is an RNA virus in the genus *Phlebovirus* of the family Bunyaviridae. The virus is transmitted by several species of mosquitoes, including *Aedes*, *Anopheles*, and *Culex* spp. Sheep and goats are the primary animal species affected, although many species of animals are susceptible to Rift Valley fever. People are readily infected via both mosquitoes and aerosols and can develop a sufficient viremia to serve as a source of infection for healthy mosquitoes. Infective aerosols can be generated during the slaughtering process through handling aborted fetuses and during necropsy procedures. Control measures include sanitation and disinfection, vaccination (available for sheep, goats, cattle, and people), vector elimination, and protection from aerosol exposure. The zoonotic nature of Rift Valley fever presents a scenario for introduction of the disease into the United States.

**Lumpy Skin Disease**—The etiologic agent, a capripoxvirus, is related serologically to the virus of sheep and goat pox. Biting insects play the major role in transmission, and the virus can also be found in the hides of infected animals. Direct contact with infected saliva may play a minor role in transmission. Cattle are the primary animal species infected. Wild ungulates have not become infected during previous epizootics

in Africa. Control methods include restriction of cattle from areas where lumpy skin disease is endemic as well as import restrictions on meat, meat products, and hides from these areas.

### Tick-Borne Diseases

**East Coast Fever**—The etiologic agent is *Theileria parva*, a protozoan parasite, transmitted by the tick *Rhipicephalus appendiculatus*. The disease primarily affects bovidae, with Indian water buffalo, African buffalo, and water buck possibly acting as wild-animal reservoirs. Vector control includes the use of insecticides and pasture management. In addition, most ticks are unable to survive for long periods without a host. Therefore, inspection of returning personnel should be performed to prevent transmission of the tick to the United States.

**Babesiosis**—The etiologic agent in cattle in East Africa is the protozoan *Babesia bigemina*, with transmission via *Boophilus* spp. ticks. Other ticks can also act as vectors, and mechanical transmission by biting flies can occur. Cattle are the principal hosts, but the water buffalo and African buffalo may also become infected. As with all tick-borne diseases, vector control is the primary means of controlling babesiosis.

**Heartwater**—The etiologic agent is an obligate intracellular rickettsial organism, *Cowdria ruminantium*. The disease is transmitted by ticks of the genus *Amblyomma*, with *A. variegatum* (the tropical bont tick) the most significant tick vector. Heartwater affects many species of ruminants with varying degrees of severity. However, *Amblyomma* ticks will feed on a wide variety of livestock, wild ungulates, small mammals, reptiles, and amphibians. Therefore, traditional vector-control measures are ineffective because the vector is a multihost tick. However, the tick is extremely fragile and cannot persist without a host for more than a few hours. Humans are not susceptible to *Cowdria ruminantium*, although the *Amblyomma* ticks may attach themselves to humans for a blood meal. Therefore, control methods should concentrate on eliminating ticks on personnel before they return to the United States.

**Nairobi Sheep Disease**—The etiologic agent is closely related to the Bunyaviridae viruses but is antigenically independent of this group. It is closely related to the Ganjam virus of goats in India and the Dugbe virus from cattle in West Africa. The virus is transmitted only by ticks, particularly via *Rhipicephalus appendiculatus*. Susceptible species include sheep and goats. The African field rat (*Arvicathus abyssinicus nubilans*) may be a reservoir host. Control measures include weekly acaricide dipping and spraying of animals, limiting the movement of animals, including rodent hosts, and removal of ticks from personnel before they return to the United States.

### Aerosol-Borne Diseases

**Contagious Bovine Pleuropneumonia**—The etiologic agent is the bacterium *Mycoplasma mycoides* subspecies *mycoides*. The disease—spread by inhalation of aerosolized droplets from an infected animal—affects animals in the genus *Bos*. The etiologic agent survives well only in vivo and is quickly inactivated when exposed to normal external environmental conditions. Most routinely used disinfectants will inactivate the bacterium. In addition, it does not survive in meat or meat products. The disease is endemic in most of Africa but was eradicated from the United States in the 19th century. Due to the inability of *M. mycoides* to survive outside the animal, the spread of contagious bovine pleuropneumonia to domestic livestock is unlikely in the face of animal import restrictions from endemic areas.

**Contagious Caprine Pleuropneumonia**—The etiologic agent of the classical, severe form of the disease is designated mycoplasma strain F38. *Mycoplasma mycoides* subspecies *capri* is considered the causative agent of a less contagious, milder form of the disease. Contagious caprine pleuropneumonia is transmitted via inhalation of infective aerosols. Outbreaks often occur after heavy rains and after cold spells, probably due to virus shedding by stressed carrier animals. The disease affects goats only and is a major scourge in many of the most important goat-producing countries in the world, including Somalia. Neither mycoplasma F-38 nor *M. mycoides* subsp. *capri* has been isolated in North America.

**Foot-and-Mouth Disease**—The etiologic agent is an enterovirus of the genus *Aphthovirus*, family Picornaviridae. Most transmission is through inhalation of infective aerosols. The virus has also been isolated in the milk and semen of infected animals and in uncooked garbage originating from FMD-infected countries. In addition, the virus has been traced to contaminated biological products such as vaccines and pituitary extracts. The virus survives the salting, drying, and disinfection processing of animal skins or hides. FMD infects domestic and wild cloven-hoofed animals. The natural hosts are cattle, sheep/goats, pigs, water buffalo/bison, deer/elk/antelope, llamas/alpacas, camels, and certain rodents. Horses are resistant. FMD-susceptible animals as well as meat, meat byproducts, and hides from FMD-infected countries are subject to import restrictions prior to entering the United States.

**Rinderpest**—The etiologic agent is a virus in the genus *Morbillivirus*, family Paramyxoviridae. The disease is antigenically related to canine distemper, measles, and peste des petits ruminants (a rinderpestlike disease of sheep and goats in Africa). Transmission is primarily through direct contact between infected and susceptible animals, and rinderpest is spread by movement of infected livestock. The disease is of major importance to cattle and buffaloes. In sheep and goats, clinical rinderpest is rare in Africa, although there is widespread serologic evidence of the disease in those species. Rinderpest is subclinical in African swine. It also infects various East African wild animals, such as buffalo and antelope.

To date, import restrictions on live animals and meat products from endemic areas have successfully prevented the spread of rinderpest to the United States.

**Peste des Petits Ruminants**—The etiologic agent is a paramyxovirus of the *Morbillivirus* genus that is spread through infected aerosols and feces. The disease affects sheep and goats and has also been reported in captive wild ungulates. Experimentally, the American white-tailed deer (*Odocoileus virginianus*) is also highly susceptible. Cattle and pigs are susceptible to the disease but are subclinical and cannot transmit the disease to other species. Peste des petits ruminants is unlikely to be a threat to domestic species in the United States unless infected animals are imported into this country.

**Sheep, Goat, and Camel Pox**—The etiologic agents in sheep and goats are capripoxviruses and are closely related, both antigenically and epidemiologically. Camelpox is caused by an *orthopoxvirus* and to date has been reported in camels only. Although the exact mechanism is unknown, transmission of these pox viruses is believed to occur through inhalation of infected aerosols, by direct contact with lesions, or mechanically through biting insects. There are no reported cases of camelpox in other camelids, such as llamas or alpacas. However, the large number of llamas and other camelidae in the United States may present a susceptible population at risk if camelpox were introduced into this country through skins or other materials from infected animals returning from Somalia.

## Avian Diseases

**Exotic Newcastle Disease**—The etiologic agent is an RNA virus of the genus *Paramyxovirus*. The virus can be categorized into three groups: (1) the exotic *velogenic* strains, which are highly pathogenic and easily transmitted; (2) the *mesogenic* intermediate strains; and (3) the *lentogenic* strains of low pathogenicity. The virus can be transmitted through inhalation of infected aerosols or through ingestion of contaminated food or water. It is present in exhaled air, respiratory discharges, feces, eggs laid during clinical disease, and all parts of the carcass during acute infection and at death. Exotic Newcastle disease occurs in domestic fowl, especially chickens, turkeys, and pigeons; ducks and geese are more resistant. Other domestic birds and wild birds are also susceptible to it.

## Other Significant Diseases

**Malignant Catarrhal Fever (MCF)**—The etiologic agent is a herpesvirus of the subfamily Gamma Herpesviridae. The two types of MCF are (1) the exotic or African, wildebeest-derived MCF, and (2) the endemic, sheep-associated MCF. Wildebeest-derived MCF is caused by alcelaphine herpesvirus-1 (AHV-1) and is carried subclinically by African antelope of the family Bovidae, subfamily Alcelaphinae, which includes wildebeest, hartebeest, and topi. Clinical disease occurs in cattle in Africa in contact with infected placental tissue and nasopharyngeal secretions of calving wildebeest. A virus identical or closely related to AHV-1 has been isolated in several zoos and wild animal parks in the United States that keep wildebeest. The increasing popularity of wild game parks in North America and other areas of the world, often in association with domestic cattle operations, increases the possibility of this disease becoming more prevalent in cattle and ranches exotic ruminants.

Sheep-derived MCF is endemic worldwide, with clinical disease associated with contact with infected lambing sheep. The etiologic viral agent is unknown but is believed to be related to AHV-1. There is serologic evidence that cattle may develop a low level of immunity to sheep-derived MCF but that stress or another immunosuppressive event may be necessary for cattle to manifest clinical sheep-derived MCF.

The virus is usually cell associated but is infective only in the cell-free state. Cell-free virus has been isolated in the placentas and nasopharyngeal secretions of neonatal wildebeest and sheep. Thus, the virus is rarely transmissible among adult animals, although cell-free virus has been found in captive adult wildebeest after stress or administration of immunosuppressive corticosteroids.

Control methods include separation of cattle from potential reservoir hosts, or a negative serological test prior to stocking cattle ranches with alcelaphine antelope species.

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